FINAL

SUPPLEMENT ANALYSIS SOUTHPOINT POWER PROJECT

DOE/EIS-0308-SA-1

Prepared for
Western Area Power Administration
Desert Southwest Region
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March 16, 1999

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Project No. 08FR987135.00

TABLE OF CONTENTS

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

1.1 INTRODUCTION

The Calpine Corporation applied to interconnect its proposed power plant with the Western Area Power Administration's (Western) Parker-Davis project in western Arizona. Western, as a major electric transmission system owner is required by existing policies and regulations, to provide access to its transmission system, when requested by an eligible organization. The proposed interconnection would integrate a major source of new generation into the Parker-Davis system which would allow Calpine to supply its power to the electric wholesale market. Based on this application, Western's proposed action is to enter into an interconnection agreement with Calpine.

1.2 HISTORY AND BACKGROUND

Calpine has requested a lease from the Fort Mohave Indian Tribe (Tribe) to construct a natural gas-fired, combined cycle power plant and associated facilities. The site would occupy 108 acres of a 320 acre site of undeveloped land on the Fort Mohave Indian Reservation. The Tribe has agreed to provide 4000 acre feet of its allotment of Colorado River water for cooling. A natural gas pipeline will be bring in the gas which will fire the power plant. Calpine has requested an interconnection with Western's electric transmission to access the wholesale market.

The U.S. Bureau of Indian Affairs has prepared an Environmental Impact Statement for the Tribe to lease a site for the power plant. The EIS is titled the Southpoint Power Plant Project. In November 1998 Western requested to become a cooperating agency on the EIS. Western proposes to adopt the Southpoint EIS for its proposed action of entering into an interconnection agreement with Calpine. In response to Calpine's request, Western conducted transmission system and load flow studies to determine how the Parker-Davis transmission system would accommodate power flows from the Southpoint power plant. The studies were completed in December 1998. Based on the results of system studies, Western identified a need to upgrade the existing Parker-Davis No. 1 transmission line to accommodate the power flows from the power plant. The upgrade of the Parker-Davis transmission line was not addressed in the Southpoint EIS. DOE regulations require a supplemental EIS if there are substantial changes to a proposal or if there is significant new information relevant to environmental concerns. Western does not believe the changes are substantial since an existing transmission line will be upgraded. It is unclear whether the proposed transmission line upgrade is substantially relevant to environmental concerns. In cases when it is unclear whether or not a Supplemental EIS is required, DOE regulations require the preparation of a Supplement Analysis. Since it is unclear whether a Supplemental EIS is required due to environmental concerns or information, Western initiated this Supplement Analysis to address the environmental impacts of the proposed upgrade as a component of the Southpoint Power Plant Project. Western will use the Supplement Analysis to determine if there is a need to prepare a supplemental EIS for the proposed Parker-Davis upgrade.

Arizona Electric Power Cooperative, one of Western's customers, and Calpine have requested a right-of-way from the U.S. Bureau of Land Management (BLM), Kingman Field Office, for a substation and a double circuit 230-kV transmission line that will bring power from the plant to the Parker-Davis No. 1 230-kV transmission line. The project is the Topock Project and BLM

issued its Finding of No Significant Impact (FONSI) in 1997. The EA is incorporated by reference into the Southpoint EIS. Western has reviewed the EA and has determined that it is sufficient for the substation additions and transmission lines that will interconnect the power plant with Western's transmission system.

The BLM, Lake Havasu Field Office is preparing an Environmental Assessment for the natural gas pipeline and is expected to issue its FONSI to finalize the EA in early 1999. Western has reviewed the preliminary EA and has determined that the environmental impacts have been adequately addressed as they relate to the Southpoint project.

The water pipeline is already permitted by the U.S. Army Corps of Engineers for the Tribe to bring water to develop Tribal lands. Western has reviewed the siting for the proposed water line and has determined that it does not warrant a supplemental EIS to address the environmental impacts of the installation of the water pipeline.

1.3 ISSUES

Following are the issues raised for each of the project components (power plant, gas line, water line and transmission line) either through a formal scoping process or through the NEPA analysis process conducted by BIA and BLM.

Southpoint Power Plant

- Effects to groundwater quality and quantity
- Effects to air quality and emissions control
- Effects on traffic volume on the Topock-Davis Dam Highway and responsibility for maintenance costs
- Visual impacts to adjacent neighborhoods and from Topock Marsh
- Employment issues such as how many jobs would be created, would all positions be filled by Tribal members, what skills would be needed and what are the proposed salary ranges
- Effects to Havasu National Wildlife Refuge

These issues were adequately addressed in the Environmental Impact Statement for the Southpoint Power Plant (Hallock/Gross 1998)

Topock Substation and Transmission Line Project

- Effects to earth resources including topography and surface water
- Effects on floodplains and wetlands
- Effects on biological resources including vegetation, wildlife, and special status species
- Effects on cultural resources
- Effects on visual resources
- Effects on minority and low-income communities

Figure 1 - Southpoint Project Location-FIGURE NOT AVAILABLE ELECTRONICALLY

These issues were adequately addressed in the Environmental Assessment for the Topock Substation and Transmission Line Project (Dames & Moore 1997a).

Natural Gas Line

The U.S. Bureau of Land Management (BLM), Lake Havasu Field Office is currently preparing an Environmental Assessment (EA) for the proposed installation of a natural gas supply line to the Southpoint Power Plant, but the document is not yet available for review. The issues are similar to those described above for the Topock Substation and Transmission Line Project, and are being addressed in the EA.

Water Line

A 6- or 8-inch water pipeline is being developed by the Fort Mohave Indian Tribe to bring water from their existing 7-pump platform in the Colorado River. In addition to delivering water to the plant site, the water will be used to open additional agricultural land and future housing developments. The six and one-half mile pipeline will be buried in the section line road, except for the last ½ mile. The pipeline construction and operation will comply with U. S. Army Corps of Engineers permit conditions.

Upgrade of the Davis-Parker Transmission System

Federal, tribal, state, and local agencies were contacted as part of scoping (see Section 5). Most agencies had no real concerns, but the BLM did raise two issues:

- Effects on bighorn sheep lambing areas
- Effects on desert tortoise and their habitat

These are addressed in Section Four of this report.

1.4 CONFORMANCE WITH EXISTING PLANS, STATUTES, AND OTHER REGULATIONS

The proposed project is consistent with Western's policies in serving its customers. It is also in conformance with the BLM Kingman Resource Area Management Plan and Final Environmental Impact Statement (1993) and the Final Yuma District Resource Management Plan and Environmental Impact Statement (BLM 1985).

Table 1.4-1 provides a summary of the required permits for the proposed transmission line upgrades.

Table 1.4-1

SUMMARY OF REQUIRED PERMITS

Permitting Agency	Permit/Authorization
U.S. Bureau of Land Management	• Amendments to existing right-of-way agreements, as required.
U.S. Fish and Wildlife Service	• Section 7 Endangered Species Act as amended; consultation and biological opinion or letter of concurrence.
Western Area Power Administration	• Operation and Maintenance Agreement • Amendments to existing right-of-way agreements, as required.
State Historic Preservation Office – Arizona and California	• Section 106 National Historic Preservation Act, as amended; complete consultation
Advisory Council on Historic Preservation	• Section 106 National Historic Preservation Act, as amended; complete consultation
Arizona Department of Environmental Quality	• National Pollution Discharge Elimination System permit for construction activities

2.1 PURPOSE AND NEED

Need for the Proposed Action

Western needs to respond to Calpine's request for the interconnection.

Purpose of the Proposed Action

The purposes of this proposed action include:

- to provide sufficient transmission service and capacity for the Southpoint Power Project without degrading service to existing customers;
- to meet the intent of requirements of Federal Energy Regulatory Commission (FERC) Order No. 888 in providing transmission access to Calpine consistent with statutory obligations;
- to ensure area transmission reliability and voltage support criteria are maintained or improved; and
- to cause the minimum adverse environmental effects consistent with Federal land management policies.

3.1 PROPOSED ACTION

Western's proposed action is to provide an interconnection to the Parker-Davis No. 1 230-kV transmission line. Western would upgrade the existing Parker-Davis No. 1 transmission line by re-conductoring and/or re-tensioning the existing facility. As a part of this, the addition of up to 15 new structures may be needed.

The U.S. Bureau of Indian Affairs has described their Proposed Action in the Southpoint EIS (DES 98-25).

The BLM Kingman Field Office described their action in the Topock Substation and Transmission Line Project EA (EA-AZ-025-97-066).

The BLM Lake Havasu Field Office described their action in the Gas Pipeline EA (which is in draft at this writing).

Transmission Line Upgrade

Proposed Facilities

To interconnect the Southpoint Power Plant (the Plant) and Parker-Davis transmission system, a new double circuit, 230-kV transmission line between the Plant and the Topock Substation would be constructed as described in the EA (Dames & Moore 1997a). Western would need to upgrade the existing Parker-Davis No. 1 230-kV transmission line between the new Topock Substation and the Parker Substation at Parker Dam. The line upgrade would involve re-conductoring and/or re-tensioning the existing line.

The specific lines and facilities that make up the proposed transmission and interconnection scenario are described below.

Parker-Davis No. 1 230-kV Transmission Line

To accommodate the power flows generated by the Plant, upgrades are proposed to the existing Parker-Davis No. 1 230-kV line between the new Topock Substation and the existing Parker Substation. The portion of the existing Parker-Davis No. 1 transmission line that would be upgraded is approximately 54 miles long, with lattice steel towers supporting single phase conductors and two overhead ground wires. The upgrade would include replacing the existing conductors, re-tensioning the existing conductors, and/or installing additional support structures. The conductor upgrade may require the addition of up to 15 new structures along the existing route to withstand wind loads and maintain required ground clearance. New structure locations would be determined during subsequent design efforts with locations selected based on engineering requirements with consideration for minimizing effects to identified environmental resources along this route. Some structures may require structural modifications. Portions of the access road system along this route may be upgraded to provide access for stringing and pulling equipment needed to install the new conductor, install new structures, modify existing structures,

and re-tension conductors. Helicopters could be used in sensitive areas. Stringing and pulling sites would be located within the existing transmission line ROW and would be reclaimed following the completion of upgrade activities.

Design Characteristics

Transmission Lines and Interconnections

Western designs, constructs, operates, and maintains transmission lines to meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor Occupational Safety and Health Standards, and Western's own policies for maximum safety and protection of its employees, landowners, their property and the public. All permanent improvements in proximity to the line, such as fences, metal gates and metallic structures, would be grounded in accordance with existing codes. Table 3.1-1 shows the design characteristics for the transmission line structures that would be placed within the existing right-of-way.

Table 3.1-1

DESIGN AND UPGRADE CHARACTERISTICS OF THE 230-kV TRANSMISSION LINE

Structure Configuration	Tubular-steel H-frame
Structure Height	Average 105 feet (range 80 to 120)
ROW Width	125 feet
Land Temporarily Disturbed: 1. Tower Base: H-frame steel pole 2. Wire pulling sites 3. Wire splicing sites 4. Material staging sites	 100 x 100 feet 120 x 125 feet per 10 miles 10 x 50 feet (0.02 acre) per 3 miles 400 x 540 feet (5 acres)
Land Required Permanently (per mile) 1. Tower base: tubular steel H-frame 2. Access roads (average acres per mile of transmission line) by ground disturbance level: use existing roads upgrade existing roads	 Two 4-foot diameter foundations (.0034 acre or 150 square feet/mile) 0.3 acre 0.3 acre
Voltage	230,000 volts (v) AC
Conductor	Single or bundle configuration: size determined by design
Tower Foundations	Drilled piers, cast-in-place concrete, pre-cast pads or inserts, or direct burial

Conductor

The conductor, the wire cable strung between transmission line towers along which the electric current flows, would be steel supported aluminum. The aluminum carries most of the electrical current and the steel provides tensile strength to support the aluminum strands.

The conductor would be treated to make it less shiny and noticeable. This "nonspecular" type of conductor would be used for the entire length of the transmission line, thereby reducing the visual impact of the transmission line.

The height of the conductors above the ground would be a minimum of 22.4 feet, based on the NESC. The minimum conductor vertical clearance dictates the exact height of each tower structure, based on topography and requirements for safety. The minimum conductor vertical clearances in some instances may be greater in response to logistical requirements or more specific NESC requirements (e.g., minimum clearance above vegetation, roads, highways, buildings, etc.).

Insulators and Associated Hardware

Insulators, which are made of an extremely low conducting material such as porcelain, glass, or a polymer, are used to suspend the conductors from each tower. Insulators inhibit the flow of electrical current from the conductor to the ground or from one conductor to another conductor. The existing assembly of insulators, which are about seven feet long, would be used to position and attach each of the three conductors to the tower. The insulators are designed to maintain electrical clearances between the conductors, the tower and the ground.

Overhead Ground Wires (Shield Wires)

To protect conductors from lightning, two nonspecular overhead ground wires, three-eighths to one-half inch in diameter, would be installed on top of the tower structures. One existing ground wire may be replaced with one containing fiber optic cable.

Rights-of-Way Needs

The existing transmission line ROW is 125 feet wide. New ROW would not be required for the transmission line upgrade.

Construction

Construction of the proposed transmission line upgrade would include the following roughly sequential major activities performed by small crews progressing along a length of line:

- surveying
- access road upgrading
- structure site clearing/grading for 15 new structures
- construction materials and conductor hauling
- foundation excavation for 15 new structures

- foundation installation for 15 new structures
- structure assembly/erection for 15 new structures
- conductor stringing

The approximate number of personnel and equipment required for construction of the transmission facilities is shown in Table 3.1-2. The peak work force is estimated to be 25 to 35 workers. The upgrade of the transmission line would require approximately six months and would commence in late 1999.

Table 3.1-2

TYPICAL PERSONNEL AND EQUIPMENT FOR TRANSMISSION LINE UPGRADE

Activity	No. of Persons	Equipment
Surveying	4	Pickup trucks
Access road upgrading	2	Dozer or motor grader, pickup trucks
Clearing of structure sites, construction yard, wire handling site	2	Dozer or motor grader, pickup trucks
Materials hauling	8 - 12	2 tractor trailers, 2 hydrocranes, 3 pickup trucks, 2 flatbed trucks
Foundation excavation	4 - 8	2-4 tractors with augers, 2-4 pickup trucks, 2 backhoes
Structure assembly	6 - 12	1-3 hydrocranes, 4-6 pickup trucks, 1-3 flatbed trucks
Structure erection	4 - 6	1 crane (50- to 100-ton capacity), 2 pickup trucks
Groundwire and conductor stringing	5 - 10	Reel trailer, tensioner, puller, digger, winch truck, pickup trucks, high reach dozers (bucket trucks)
Cleanup	3 - 6	Flatbed and/or pickup trucks
Seeding	3	Disc plow with tractor, hydroseeder, pickup truck, flatbed truck

Disturbances associated with the construction of the transmission system are discussed below and acres of disturbance are shown in Table 3.1-3 by component.

Table 3.1-3

DISTURBANCE FROM CONSTRUCTION OF THE PROPOSED UPGRADE

Component	Quantity	Acres Disturbed	
		Temporary	Permanent
Access Road Upgrade (0.3 acre/mile)	50 miles	--	15
New Structures H-frame installed at selected sites	15 structures	3.5	0.01
Conductor Pull Sites	5 sites	6.1	--

Surveying

Survey work would locate the transmission line centerline, determine accurate profiles along the centerlines, and locate structures.

Access

Access by heavy construction vehicles and equipment along the ROW would be required for the construction, operation, and maintenance of the proposed transmission upgrade. Road or trail access exists to, or near, all of the potential sites of new structures. Sometimes these roads or trails are within the existing ROW and sometimes they detour from it. In some locations, particularly where crossing steep slopes, broken terrain and drainageways, the existing roads and trails would require improvement (grading, widening and/or adding culverts at drainage way crossings) to allow passage of the required equipment.

ROW Clearing

Little, if any, ROW clearing is expected. Clearing would be performed where necessary to provide safe access for construction equipment. Where possible, access would be overland, with no blading or grading of new roads.

Structure Site Clearing and Grading

At each new structure site, an area would be disturbed by the movement of vehicles, assembly of structure elements, and other operations. Approximately 100 x 100 feet would be required for new 230-kV structures. Approximately 80 x 80 feet would be disturbed at each existing structure site by the movement of vehicles. Additional clearing is not anticipated.

Construction Yard and Material Handling Sites

It is estimated that a temporary construction yard of approximately 5 acres would be required. This would serve as a reporting location for workers, parking space for vehicles, and for equipment and materials storage. These facilities would be located near Lake Havasu City in a previously disturbed area.

Construction Materials Hauling

Construction materials would be hauled to construction yards from the local highway or rail network and then to structure sites using access roads described above.

Foundation Excavation and Installation

Vertical excavations for foundations would be made with power drilling equipment. Where soils permit, a vehicle-mounted power auger would be used. In rocky areas, foundation holes would be excavated by drilling, blasting, or installing special rock anchors. In extremely sandy areas, water or a gelling agent could be used to stabilize soil before excavation. All safeguards associated with using explosives (e.g., blasting mats) would be employed. Blasting activities would be coordinated with landowners and land managing agencies, particularly for the safety and protection of sensitive areas (e.g., springs, cultural resources).

If needed, concrete footings would be cast in place following excavation. These would be installed by placing reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material (excavated soil) would be used for fill where suitable and the remainder would be spread at the tower site.

Foundation excavation and installation would require access to the site by a power auger or drill, crane, material truck, and ready-mix concrete trucks.

Structure Assembly/Erection

Erection crews would assemble structures and, using a large crane, directly bury them or position them on foundations. Typical structures are shown on Figure 2.

Shield Wire and Conductor Stringing

Reels of conductor and overhead shield wire would be delivered to wire-handling sites spaced about every 10 miles along the ROW. Level locations would be selected so little or no earth moving would be required. These sites may have to be cleared of vegetation and would be disturbed by the movement of vehicles and by other activities. Conductors and shield wires would then be pulled into place from these locations. Stringing and tensioning sites would be selected to avoid environmentally sensitive resources.

ROW Cleanup and Restoration

All structure assembly and erection pads not needed for normal maintenance would be returned to their original contour, if needed, or reclaimed to the extent to blend with adjacent landforms. Waste construction materials and rubbish from all construction areas would be collected, hauled away and disposed of at approved sites. All construction areas would be restored to their original condition, if feasible, and any damaged gates and fences would be repaired.

Figure 2 - Structure Types-FfIGURE NOT AVAILABLE ELECTRONICALLY

Safety Program

Western would require construction contractors to prepare and conduct a safety program (subject to Western's approval) in compliance with all applicable Federal, state and local safety standards and requirements, and Western's general practices and policies prior to the commencement of construction. The safety program would include procedures for accident prevention, use of protective equipment, medical care of injured employees, safety education, fire protection, and general health and safety of employees and the public. Western would also establish provisions for taking appropriate actions in the event the contractor fails to comply with the approved safety program.

Operation and Maintenance

Use of the ROW by the landowner would be permitted for any purpose that does not create a safety hazard or interfere with the rights of Western. Day-to-day operation of the line would be directed by system dispatchers. These dispatchers use communication facilities to operate circuit breakers that control the transfer of power through the line. These circuit breakers also operate automatically to ensure safety, e.g., in the event of structure failure or a conductor failure.

Western's preventative maintenance program for transmission lines would include routine aerial and ground patrols. Aerial patrols would be conducted quarterly. Ground patrols would be conducted once a year. In addition, climbing inspections would be conducted on an on-going basis, with each structure being climbed and inspected once every 5 years. Maintenance may include repairing damaged conductors, inspection and repair of towers, and replacing damaged and broken insulators. In addition to maintaining structures, conductors, and clearance within the ROW, Western would maintain any gates installed by Western and maintain the access roads to minimize erosion. Transmission lines are sometimes damaged by storms, floods, vandalism, or accidents and require immediate repair. Emergency repair would involve prompt movement of crews to repair damage and replace any equipment. If access roads are damaged as a result of the repair activities, Western would repair them as required.

Abandonment

Should the transmission line no longer be needed, the transmission structures would be removed. The shield wires, conductors, insulators, and hardware would be dismantled and removed from the ROW. Structures embedded in the ground would be pulled out. Concrete foundations would be removed if it could be done with a minimum of damage. Cranes, large trucks and pickup trucks, as well as earth-moving equipment in a few steeper areas, would be required for efficient removal of the transmission line. Following abandonment and removal of the transmission line, any areas leveled would be regraded to their original condition, if feasible. Similarly, areas disturbed and stripped of vegetation during the dismantling process would be regraded and reseeded to prevent erosion, if required.

Standard Mitigation

The Project's Standard Construction Practices, which have been adopted by Western for the proposed transmission upgrade, are presented in Tables 3.1-4 and 3.1-5.

Table 3.1-4

GENERIC MITIGATION

1.	All construction vehicle movement outside the ROW normally would be restricted to existing access or public roads.
2.	The limits of construction activities normally would be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.
3.	In construction areas where recontouring is not required, vegetation would be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.
4.	In construction areas (e.g., conductor pull sites and tower sites) where ground disturbance is substantial or where recontouring is required, surface restoration would occur as required by the landowner or land management agency. The method of restoration normally would consist of returning disturbed areas back to their natural contour, reseeding (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches. To avoid fragmentation of desert bighorn habitat, fencing would not be used to close roads or otherwise limit access. These instances would be reviewed on a case-by-case basis.
5.	Towers and/or ground wire would be marked with highly visible devices where required by governmental agencies (e.g., Federal Aviation Administration) for aircraft safety.
6.	Prior to construction, all supervisory construction personnel would be instructed on measures to protect cultural, paleontological, and ecological resources. To assist in this effort, the construction contract would address (a) Federal, state, and tribal laws regarding antiquities, fossils, plants and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.
7.	Cultural resources would continue to be considered during post-EIS phases of Project implementation. This would involve intensive surveys to inventory and evaluate cultural resources within the ROW and any adjacent impact zones beyond the ROW, such as access roads and construction equipment yards. In consultation with appropriate land managing agencies, the State Historic Preservation Officer, and Native American Organizations, specific mitigation measures would be developed and implemented to mitigate any identified impacts. These may include Project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies. In the event of an inadvertent discovery of cultural resources during construction, all ground disturbing activities in the area of the discovery would cease until the discovery could be assessed for significance by a qualified archaeologist.
8.	Western would respond to individual complaints of radio or television interference generated by the transmission line by investigating the complaints and implementing appropriate mitigation measures (e.g., adjusting or using filtering devices on antennae). The transmission line would be patrolled on a regular basis so that damaged insulators or other transmission line materials, which could cause interference, are repaired or replaced.
9.	Western would apply mitigation needed to eliminate problems of induced currents and voltages onto conductive objects sharing a ROW to the mutual satisfaction of the parties involved.

Table 3.1-4

GENERIC MITIGATION

10. Transmission line materials would be designed and tested to minimize corona. Tension would be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution would be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.
11. Western would continue to monitor studies performed to determine the effects of audible noise and electrostatic and electric magnetic fields to ascertain whether these effects are significant.
12. Culverts would be installed where needed. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial streambanks. In addition, road upgrades would include dust-control measures during construction in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.
13. All requirements of those entities having jurisdiction over air quality matters would be adhered to and any permits needed for construction activities would be obtained. Open burning of construction trash would not be allowed unless permitted by appropriate authorities.
14. Fences and gates would be repaired or replaced to their original condition prior to Project disturbance as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land-managing agency.
15. Nonspecular conductors and dulled structure components would be used to reduce visual impacts.
16. No non-biodegradable debris would be deposited in the ROW. Slash and other biodegradable debris would be left in place or disposed of in accordance with agency requirements.
17. Mitigation measures developed in conjunction with Federal, state and tribal authorities would be adhered to.
18. Hazardous materials would not be released anywhere as part of the proposed action. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed daily to a disposal facility authorized to accept such materials.
19. Species of concern would continue to be considered during post-EIS phases of Project implementation in accordance with management policies set forth by the appropriate land managing agency. This may entail conducting surveys for plant and wildlife species of concern along the transmission line route and associated facilities (i.e., access and spur roads, staging areas) as agreed upon by the land managing agency and lead Federal agency. In cases where such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat and may include altering the placement of roads or towers as practicable and monitoring construction activities.

Table 3.1-5

SELECTIVELY RECOMMENDED MITIGATION MEASURES

Note: These selective mitigation measures apply only to specific construction activities that are identified in this report or during field investigations.
1. No widening or upgrading of existing access roads would be undertaken in the area of construction and operation, except for repairs necessary to make roads passable.
2. In designated areas, structures would be placed to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites, or to allow conductors to clearly span the features within limits of standard tower design. This would minimize the amount of disturbance to the sensitive feature or reduce visual contrast.
3. Standard tower design would be modified to correspond with spacing of existing transmission line structures where feasible. This would reduce visual contrast or potential operational conflicts.
4. With the exception of emergency repair situations, ROW construction, restoration, maintenance and termination activities in designated areas would be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed threatened and endangered, or other sensitive species. This list would be approved in advance by the BLM authorized officer in consultation with the FWS.
5. Towers would comply with Federal Aviation Administration Guidelines to minimize aircraft hazards (Federal Aviation 77).
6. Desert Tortoise Mitigation Plan In areas designated by the BLM as Category II or III desert tortoise habitat, the mitigation measures described in Appendix A would be implemented.
7. Locations of all observations of rosy boa would be mapped on a 7-1/2 minute topographical map with township, range and section noted, date, observer's name and vegetation type. Copies of this information would be given to the BLM authorized officer and to the Arizona Game & Fish Department in Phoenix.
8. All rosy boa or chuckwalla found on the ground surface within construction areas would be moved a minimum of 500 feet (preferably not more than one-quarter of a mile, but up to one mile from their original location) and placed in a shaded location. Rosy boa or chuckwalla that wander onto construction areas during construction periods also would be removed to a safe location if necessary and would be moved solely for the purpose of preventing death or injury.

3.2 NO ACTION

Under a No Action Alternative, no power plant would be built and no interconnection agreement would be needed and no gas pipelines would be built. Neither the Preferred Alternative, nor the other two alternatives, would be developed. All three alternative sites would remain in their present condition. Tribal economic development goals would not be met.

No new Topock transmission line or substation would be built which could jeopardize existing and future electrical service in the area to some customers.

Without the gas pipelines, no power plant would be constructed.

The water pipeline is not integral to the Southpoint project.

3.3 ALTERNATIVES CONSIDERED

Southpoint Power Plant

Alternatives considered for the proposed Southpoint Power Plant Project are described in the BIA EIS (Hallock/Gross 1998):

Alternative Two

Alternative Two (Alternative One was the Proposed Action/Preferred Alternative) would construct and operate a power plant on approximately 160 acres on the Fort Mojave Indian Reservation (FMIR) on a site approximately two and one half miles northwest of the Preferred Alternative site. The power plant would be identical in size to that proposed for the Preferred Alternative. Natural gas would be available to the plant from the same sources as for the preferred alternative and would require construction of two branch lines across BLM land to the FMIR's boundary. The site would connect to the Topock Substation and transmission corridor.

Alternative Three

Alternative three would construct and operate a power plant on approximately 160 acres on a site immediately to the south and east of the Preferred Alternative site, on the south side of the Davis Dam-Topock Highway. The power plant would be identical in size to that proposed for the Preferred Alternative. Natural gas would be available to the plant from the same sources as for the preferred alternative and would require construction of two branch lines across BLM land to the FMIR's boundary. The site would connect to the Topock Substation and transmission corridor.

Topock Substation and Transmission Line Project

The Environmental Assessment for the Topock Substation and Transmission Line Project considered two options for structural configuration and two options for road access, in addition to the No Action alternative.

Structural Configuration

The two alternatives are variations of the same plan:

- Alternative 1 would combine two 230-kV circuits and one 69 kV circuit on a single steel structure, and include an additional parallel 69 kV line on a single wooden pole.
- Alternative 2 would include two 69 kV parallel single wooden pole structures as well as two 230-kV circuits separated onto parallel wooden H-frame structures.

Road Access

- Alternative 1 would be from the west by an existing jeep trail connecting to Willow Road and crossing an Arizona State Land section.

- Alternative 2 would be from the east via an existing access road that connects to U.S. Highway 66 over federal property; construction traffic would not be permitted along this route.

Natural Gas Pipelines

Several routing and source alternatives were considered for the natural gas pipelines. These will be addressed in the BLM Lake Havasu Field Office's EA.

Water Supply Pipeline

The water pipeline would be built with or without the Southpoint project.

3.4 ALTERNATIVES CONSIDERED AND ELIMINATED

A new transmission line to Mohave Generating station was considered but eliminated because it would not meet the delivery need of Calpine.

Southpoint Power Plant

Numerous alternatives were considered for each of six project components of the Southpoint Power Plant Project. The project components and alternatives for each of the alternatives eliminated from further consideration are listed below. The description of these alternatives from the EIS (Hallock/Gross 1998) is incorporated by reference.

Project Component	Alternatives Eliminated
• Sites	• Yucca Site • BLM Site
• Plant Designs	• Air Cooled Power Plant • Larger or Smaller Power Plant
• Process Water Supply	• Wellfield Development Only • Colorado River Water Only • Effluent Water From the Fort Mojave Tribal Utility Authority
• Process Water Disposal	• Location of Evaporation Pond West of Proposed Power Plant • Treatment at Wastewater Plant • Treatment at Power Plant • Supply Topock Marsh • Agricultural Irrigation • Injection Well • Return Flow Trough Natural Drainages • Trucking to Off-Site Disposal Facility

Project Component	Alternatives Eliminated
• Domestic Wastewater Disposal	• On-site Package Treatment Plant • Septic System • Connection to FMIT Wastewater Treatment Plant
• Fuel Supply	• Fuel Oil • Other Gases • Coal

Topock Substation and Transmission Line Project

Alternatives considered but eliminated from further consideration for the Topock Substation and Transmission Line Project are described below. The description of these alternatives from the EA (Dames & Moore 1997a) is incorporated by reference.

Project Component	Alternatives Eliminated
• Transmission Cables	• Underground installation • Individual loop lines from the Davis-Parker Nos. 1 and 2 to an existing or to a new substation
• Routing	• Several optional routes were considered
• Sites	• Several optional sites for the substation were considered

Natural Gas Supply Lines

Alternatives to the gas pipelines will be addressed in the BLM Lake Havasu Field Office's EA.

4.1 ENVIRONMENTAL SETTING

The proposed upgrade of the Parker-Davis transmission line between the new Topock Substation in western Arizona and the Parker Substation just across the California border would be within an existing ROW (Figure 1). The existing route trends from the north to the southeast passing through the Mojave Mountains just before entering the northeast corner of Lake Havasu City. South of Lake Havasu City, the Parker-Davis No. 1 transmission line passes through a small section of Lake Havasu State Park, crosses Lake Havasu and ends at the Parker Substation near Parker Dam. Except where the route passes through Lake Havasu City, landownership is primarily BLM. Minor inclusions of state and private land occur just north and south of Lake Havasu City.

Notable features in proximity to the existing line include Warm Springs Wilderness Area south of Route 66, the Crossman Peak Natural Scenic Area northeast of Lake Havasu City, and Lake Havasu State Park and Lake Havasu.

The area in the vicinity of the Parker-Davis No. 1 ROW consists of fan terraces dissected by numerous ephemeral drainages. The terrain is nearly level to moderately steep, and elevations range from about 950 to 1275 feet above mean sea level. Vegetation in the project area is representative of the Mojave and Sonoran desertscrub and consists primarily of sparse creosotebush and white bursage. The arid climate in the Project Area is characterized by mean annual precipitation of 3 to 7 inches, and mean annual temperatures of 70 to 74^{o} F.

Negative Declaration

The following critical elements are not traversed by or would not be adversely affected by the proposed upgrade.

- Prime or unique farmlands
- Air quality
- Wild and scenic rivers
- Health and safety
- Hazardous or solid wastes
- Land use
- Areas of Critical Environmental Concern
- Wetlands and riparian habitat

4.2 GEOLOGY AND SOILS

Affected Environment

The proposed upgrade is in the Basin and Range Province. The characteristic landform of this province is elongated mountain ranges trending northwest-southeast, separated by broad alluvial valleys. The mountains are predominantly marine limestones, shales, sandstones and volcanic or

plutonic rock. The valleys are filled with volcanics, alluvium and lacustrine sediments (Nations and Stump 1980). Elevations in the region range from approximately 700 to 1,650 feet.

Soils on the flood plains, alluvial fans or bajadas, and fan terraces are very deep, very gravelly loamy sand, sandy loam or loam with a slight to moderate hazard of water erosion and a slight to moderately high hazard of wind erosion. Slopes range from 0 to 40 percent. Soils on steep hills and mountain slopes are shallow to very shallow gravelly sandy loams and rock outcrops with a severe hazard for water erosion and slight wind erosion hazard. Slopes range from 20 to 65 percent (NRCS 1998).

Environmental Effects

Impacts of constructing the Southpoint Power Plant to geology and soils are adequately addressed in the EIS (Hallock/Gross 1998).

The gas pipeline and Topock project were found not to have significant impacts by the BLM.

Wind erosion in arid climates is occasionally severe. When the protective vegetative cover is removed, soils become dry and are subjected to strong winds. However, in the Project Area, the potential for accelerated erosion from wind is greatly reduced due to the high percentage of coarse fragments on much of the soil surface. Some fine textured soils without this natural protection would be susceptible to accelerated erosion from wind when disturbed for project activities.

The potential for soil erosion by water increases with the high intensity rainfall typical of this area, on steep slopes, and with the removal of the vegetative cover. Shallow soils on steep slopes would be the most susceptible to accelerated erosion due to ground disturbing project activities.

Accelerated soil erosion, whether by wind or water, can result in sediment being carried off-site and deposited in adjacent water bodies and subsequently decreasing water quality or reducing drainage capacity in the many natural drainages that cross the proposed upgrade. All soils affected by the project would remain vulnerable to erosion hazards as long as the surface remains unprotected.

Mitigation

Because existing access roads will be used for the entire length of the proposed upgrade, impacts to soils would not be significant. Additionally, generic and selective mitigation measures presented in Tables 3.1-4 and 3.1-5 would further minimize potential impacts to soils. Specifically, Generic Mitigation Measures Nos. 1, 3, 4, 6, 12, 16, 17 and 18, and Selective Mitigation Measure No. 1 would minimize soil disturbance, leave protective vegetation in place wherever possible, and restore disturbed areas as required by the landowner or land management agency. No further mitigation is recommended.

4.3 BIOLOGICAL RESOURCES

Affected Environment

The project area is within the Mojave desertscrub biome between the new Topock substation south to approximately Interstate 40, and Sonoran desertscrub from Interstate 40 south to the

Parker site (Figure 1) (Brown 1994; Masters 1998). Generally, Mojave desertscrub species are found on the plains and the Sonoran species on the bajadas and hills. Species composition for these communities is presented in Brown (1994).

The numerous ephemeral washes (xeroriparian areas) that cross the project area have a vegetative composition similar to the surrounding uplands, but with greater shrub density and a much lower cover of annuals.

The Mojave and Sonoran desertscrub communities occurring in the Project Area support an array of wildlife species including mammals, birds, and reptiles. Typically, the numbers and diversity of wildlife species are much greater in the Sonoran desert than the Mojave desert; however, since much of the project area is in a transitional zone, species occurrence is expected to be similar throughout the area. Brown (1994) provides an extensive list of wildlife species that occur in these ecosystems.

Environmental Effects

Impacts of constructing the Southpoint Power Plant to biological resources are adequately addressed in the EIS (Hallock/Gross 1998).

Impacts of the gas pipeline and Topock project were found not significant by the BLM.

Construction of 15 new H-frame structures and disturbance at 5 conductor pull sites would result in the temporary disturbance and short-term loss of approximately 2.9 acres of Mojave desertscrub and 6.7 acres of Sonoran desertscrub vegetation. Annuals would be expected to regenerate within about one year, if adequate precipitation occurs, but it could take up to 20 years for complete natural regeneration of shrub species due to the arid climate and limited amount of moisture (Hobbs 1998). In addition, about 4 acres of Mojave and 11 acres of Sonoran desertscrub would be permanently lost as a result of access road upgrades and installation of the 15 new structures.

Many of the wildlife species may experience temporary displacement but, by virtue of their mobility, they would not be adversely affected by project construction and maintenance activities.

Desert bighorn sheep is a special status species for BLM and AGFD because they have shown sensitivity to human disturbance. Bighorn sheep are currently thriving throughout much of their range, but because of their inherent sensitivity to environmental disturbance (BLM 1993), construction and routine maintenance activities would be restricted during the seasonal closure of designated bighorn sheep lambing areas between January 1 to June 30. Therefore, no impacts to desert bighorn sheep are anticipated.

Year-round road closure in bighorn sheep habitat south of Lake Havasu City is shown on Figure 3. Western has access to the substation and the existing transmission line south of the city for maintenance. The proposed project would not adversely affect bighorn sheep because of the short duration of activities. Public access would continue to be restricted.

Figure 3 - Bighorn Sheep Closures-FIGURE NOT AVAILABLE ELECTRONICALLY

Mitigation

Because existing access roads will be used for the entire length of the proposed upgrade, impacts to vegetation would not be significant. Additionally, generic and selective mitigation measures presented in Tables 3.1-4 and 3.1-5 would further minimize potential impacts to biological resources. Specifically, Generic Mitigation Measures Nos. 1, 3, 4, 6, 7, 12, 16, 17 and 18, and Selective Mitigation Measure No. 1 would minimize vegetation disturbance, leave protective vegetation in place wherever possible, and restore disturbed areas as required by the landowner or land management agency. In addition, with the exception of emergency situations, project activities would not occur during sensitive periods for bighorn sheep (e.g., January 1 - June 30). No further mitigation is recommended.

Threatened, Endangered, and Sensitive Species

Affected Environment

Biological resources that are protected by law, identified as sensitive, or given management priority by resource management agencies were considered. Existing data sources were consulted to prepare a list of sensitive biological resources known to occur or are potentially present in the project area. Data sources included Arizona Game and Fish Department (1998), the U.S. Fish and Wildlife Service's current threatened and endangered species list for the southwest region (USFWS 1998), and a review of the existing literature. Only species for which there is suitable habitat in or near the transmission line ROW are listed on Table 4.3-1.

The types of sensitive biological resources considered are listed below:

- Federally listed endangered and threatened species and designated critical habitat
- Arizona Wildlife of Special Concern
- California listed endangered and threatened species
- Arizona and California species of concern
- Plant species protected under the Arizona Native Plant Protection Act
- Plant species protected under the California Desert Native Plant Act

Environmental Effects

Impacts of constructing the Southpoint Power Plant to sensitive species are adequately addressed in the EIS (Hallock/Gross 1998).

Impacts of the gas pipeline and Topock project were found not significant by the BLM.

Table 4.3-1

THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES OCCURRING IN THE PROJECT AREA

Common Name	Scientific Name	Status [1]			Habitat in the Project Area	Potentially Affected[2]
		Federal	Arizona	California		
Mammals						
California leaf-nosed bat	*Macrotus californicus*	--	WC	SC	Caves, mines, tunnels in desert scrub (AGFD 1988)	No-Bat
Greater western mastiff bat	*Eumops perotis*	--	SC	SC	Steep, rugged rocky canyons (AGFD 1996)	No-Bat
Spotted bat	*Euderma maculatum*	--	--	SC	Cliffs near riparian areas and along the Colorado River (WCFS 1995)	No-Bat
Birds						
American peregrine falcon	*Falco peregrinus anatum*	E	WC	E	Open areas with cliffs; along the Colorado River (Terres 1991)	No-Migrant
Yuma clapper rail	*Rallus longirostris yumanensis*	E	WC	T	Marsh habitat along Colorado River, Topock Marsh (AGFD 1996)	No-Riparian
Southwestern willow flycatcher	*Empidonax traillii extimus*	E	WC	--	Riparian habitat along Colorado River, Topock Marsh (AGFD 1996)	No-Riparian
California brown pelican	*Pelecanus occidentalis californicus*	E	--	E	Riparian woodland and shrub habitat along the Colorado River (Terres 1991)	No-Migrant
Bald eagle	*Haliaeetus leucocephalus*	T	SC	E	Riparian habitat along the Colorado River (Terres 1991)	No-Migrant
California black rail	*Laterallus jamaicensis coturniculatus*	--	WC	T	Sedge, cattail and bulrush marshes along the Colorado River (AGFD 1996)	No-Riparian
Western least bittern	*Ixobrychus exilis*	--	SC	SC	Cattail marshes along Colorado River (Terres 1991)	No-Riparian
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	--	SC	E	Mature cottonwood-willow riparian forests (CDFG 1992)	No-Migrant
Clark's grebe	*Aechmophorus clarkii*	--	SC	--	Lakes on the Colorado River (AGFD 1988)	No-Migrant, riparian

Table 4.3-1

THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES OCCURRING IN THE PROJECT AREA

Common Name	Scientific Name	Status [1]			Habitat in the Project Area	Potentially Affected[2]
		Federal	Arizona	California		
Black-tailed gnatcatcher	*Polioptila melaneura*	--	--	SC	Desert drywash woodland and floodplain woodland and scrub (Terres 1991)	No-Wide
Crissal thrasher	*Toxostoma dorsale*	--	--	SC	Mesquite forest within floodplain woodland and scrub habitat (Phillips et al 1964)	No-Wide
Le Conte's thrasher	*Toxostoma lecontei*	--	--	SC	Creosote bush desert and sandy washes with sparse vegetation (Terres 1991)	No-Wide
Reptiles						
Desert tortoise (Mojave population)	*Gopherus agassizii*	T	--	T	Mojave desertscrub (USFWS 1994)	Yes
Desert tortoise (Sonoran population)	*Gopherus agassizii*	--	WC	--	Sonoran desertscrub, rocky foothills (AGFD 1996)	Yes
Mojave fringe-toed lizard	*Uma scoparia*	--	SC	SC	Near Parker on fine, wind-blown sands and along Colorado River (AGFD 1996)	No-Sand
Fish						
Bonytail	*Gila elegans*	E	WC	E	Colorado River, Lake Havasu (AGFD 1996)	No-Water
Razorback sucker	*Xyrauchen texanus*	E	WC	E	Colorado River, Lake Havasu (AGFD 1996)	No-Water
Humpback chub	*Gila cypha*	E	SC	--	Colorado River (AGFD 1996)	No-Water
Woundfin	*Plagopterus argentissimus*	E	SC	--	Colorado River (AGFD 1996)	No-Water
Colorado roundtail chub	*Gila robusta*	--	SC	--	Colorado River (AGFD 1996)	No-Water
Amphibians						
Lowland leopard frog	*Rana yavapaiensis*	--	SC	--	Along Colorado River (AGFD 1996)	No-Riparian
Plants						
Saguaro cactus	*Carnegiea gigantea*	--	HS	CNPS-1	Rocky or gravelly soils of canyons and hills of the Sonoran Desert (Benson 1974)	Yes

Table 4.3-1

THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES OCCURRING IN THE PROJECT AREA

Common Name	Scientific Name	Status [1]			Habitat in the Project Area	Potentially Affected[2]
		Federal	Arizona	California		
Crucifixion thorn	*Castela emoryi*	--	--	CNPS-2	Drainages in Mojave and Sonoran desert scrub (Benson 1981)	Yes

[1] Status codes are as follows.

Federal Listing
E Endangered
T Threatened

Arizona Listing
WC Wildlife of Special Concern in Arizona
SC Species of concern
HS "Highly Safeguarded" under Arizona Native Plant Act

California Listing
E State listed endangered
T State listed threatened
SC Species of concern
CNSP-1 Plants rare and endangered in California and elsewhere; mandatory CEQA consideration
CNSP-2 Plants rare and endangered in California but more common elsewhere; mandatory CEQA consideration

[2] Reason for not likely to be affected

Bat - Key habitat of mines, caves, crevices in cliffs, and old buildings, are highly unlikely to be directly impacted by transmission line maintenance activities.
Migrant - Only present as migrants, transients, or wintering birds. No habitat features sensitive to maintenance activities are present.
Water/Riparian - Aquatic and marsh birds and fish potentially occurring only at the Colorado River. Maintenance activities to onshore structures are unlikely to affect these species.
Wide - Wide-ranging species. Individuals may be temporarily displaced during transmission line maintenance activities. Direct impacts are unlikely because of their mobility, and effects on habitat would be insignificant.
Sand - ROW does not cross sandy habitat suitable for Mojave fringe-toed lizard.

Endangered and threatened species, and wildlife of special concern are protected under the Endangered Species Act or similar state legislation or regulations. Ten federally listed endangered and threatened species occur or were historically present in the Project Area (Table 4.3-1). No effects are expected for the peregrine falcon, California brown pelican or bald eagle because they occur only as migrants or transients. The Yuma clapper rail, and southwestern willow flycatcher are associated with riverine or riparian habit, which would not be affected by upgrading Parker-Davis No. 1.

Four federally listed species on Table 4.3-1 are fish, most of which have been extirpated from the lower Colorado River. Upgrading Parker-Davis No. 1 would not affect riverine habitat and no effects are expected to these species.

The Mojave desert population of desert tortoise (west of the Colorado River) is listed as threatened by the US Department of Interior (USDOI). The Sonoran desert tortoise (east of the Colorado River) has no federal status however it is a species of special concern to the BLM and the ADFG. The Arizona portion of the transmission line is within the general range of the Sonoran desert tortoise population. Category I habitat does not occur in the vicinity of the transmission line (Masters 1998). However, Category II and III habitat does occur in the area south of I-40 as shown on Figure 4. The transmission line within the California portion of the route is within the general range of the Mojave population of desert tortoise. Upgrading the existing Parker-Davis No. 1 transmission line and the access roads could affect desert tortoise.

Other state listed special status species potentially occurring in the Project Area include three species of bats, seven birds, the Mojave fringe-toed lizard, and the lowland leopard frog. None of these species would be affected by project activities because their primary habitat (riparian; steep cliffs; or fine, wind blown sand) is not going to be disturbed, or because they are present only as migrants. A few wide-ranging species such as black-tailed gnatcatcher, crissal thrasher and Le Conte's thrasher may be temporarily displaced.

The saguaro cactus is highly safeguarded in Arizona and is listed as rare and endangered in California. Under the Arizona Native Plant Act, highly safeguarded means 'plants whose prospects for survival are in jeopardy or which are in danger of extinction throughout all or a significant part of their range." This species typically grows in the rocky or gravely soils of canyons and hills of the Sonoran Desert at elevations of 600 to 3,600 feet. Previous surveys in California indicate this species does not occur on the California portion of the route (WCFS 1995). Saguaros were observed in the general area and could be present along the Arizona portion of the ROW. This species could be affected by ground disturbing activities.

Crucifixion thorn is listed as highly safeguarded in Arizona, and rare and endangered in California, but it is more common elsewhere in its range. This species is typically associated with drainages in Mojave and Sonoran desertscrub habitats (Benson 1981). It is found occasionally on gravelly slopes and dry plains within these same habitat types. Known locations of crucifixion thorn occur along the Colorado River north of Parker Dam. No individuals were identified in the California part of the Project Area during a biological survey in 1995 (WCFS) but it may be present along the Arizona part of the route. No impacts from the proposed upgrade are expected.

Figure 4 - Desert Tortoise Habitat-FIGURE NOT AVAILABLE ELECTRONICALLY

Mitigation

Preconstruction surveys for sensitive species and consultation with the US Fish and Wildlife Service would be conducted prior to initiation of the project. If listed species are, or may be present, Western will prepare a biological assessment to determine if the proposed action may affect listed species. Based on that determination, Western will, if needed, enter into formal consultation with the Fish and Wildlife Service.

Western's standard desert tortoise mitigation measures include pre-construction surveys, monitoring, and relocation of any tortoises found in the ROW by a qualified biologist. Other measures such as worker education, imposed speed limits, and minimizing disturbance are detailed in the mitigation measures presented in Appendix A.

Protected Arizona Native Plants, specifically, non-opuntia cacti would be salvaged and replanted out of harm's way.

These mitigation measures would minimize any potential adverse impacts to sensitive biological species from project activities resulting in no significant impacts to sensitive species. No further mitigation is recommended.

4.4 FLOODPLAINS

Affected Environment

The Project Area is subject to high intensity summer and fall rainstorms which can lead to flash flooding. The greatest hazard from these storms occurs when the usually dry washes distributed throughout the Project Area fill their channels and overflow their banks with runoff (BLM 1985). Federal Emergency Management Agency floodplain maps show many of these ephemeral drainages crossed by the transmission line are within the floodplain area categorized as Zone A. Zone A is defined as areas of 100-year flood for which the hazard factors have not been determined. In the area north of Lake Havasu City, several drainages with an average 200 to 400 foot-wide floodplain are categorized as Zone AO which is defined as 100 year shallow flooding where depths average 1 to 3 feet. These areas are interspersed with zones of minimal flooding classified as Zone C (FEMA 1982).

Environmental Effects

Executive Order 11988, as amended, requires Federal agencies to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative."

Impacts of constructing the Southpoint Power Plant to floodplains are adequately addressed in the EIS (Hallock/Gross 1998).

Impacts of the gas pipeline and Topock project were found not significant by the BLM.

Impacts to floodplains would occur if transmission line structures were erected in any of the numerous ephemeral drainages that cross the route, or if a wire pulling site were located in a floodplain.

Western would place structures to span drainages and floodplains to the extent practical and would not locate pulling sites within a floodplain (see Table 3.1-5, Measure No. 2). Therefore, no impacts to floodplains are expected.

Mitigation

Any access roads that traverse floodplains would be upgraded, if necessary. These upgrades would be designed in accordance with floodplain protection standards. The result would be no significant impacts.

4.5 VISUAL QUALITY

Affected Environment

The description of the visual resources of the Project Area are based on the methodology described in the BLM's Visual Resource Inventory Manual (BLM 1986).

The transmission line is located in the BLM Kingman and Lake Havasu Field Office jurisdictions. The Kingman Resource Management Plan (RMP) describes and maps the VRM classifications for the resource area. Mapped VRM information is not available for the Lake Havasu Resource Area, however, the BLM (1996) evaluated the scenic quality of much of the Project Area, and this information is used in this description.

Near the Topock Substation (Figure 1) the landscape is generally flat with characteristic desertscrub vegetation. This area is classified as VRM Class IV. As the Parker-Davis No. 1 line proceeds south it passes through a similar type of landscape until Fivemile Wash, about 4.5 miles south of the Topock substation. Approximately three miles south of the substation the line crosses Route 66, a BLM Backcountry Byway. South of Route 66 the transmission line forms the western boundary of the Warm Springs Wilderness Area. Although the wilderness area is classified as VRM Class I, the ROW is outside of the wilderness area and is still VRM Class IV landscape. At Fivemile Wash the VRM classification changes to VRM III for about 0.5 miles as the line crosses the wash. The higher VRM rating is due to the diversity of topography and vegetation contained in the wash.

After leaving Fivemile Wash the landscape returns to the more common desert scenery and is rated as VRM Class IV. About 7 miles south of the substation the line passes into the Havasu Resource Area. The landscape remains one of minimal diversity and is rated as scenic quality Class C or B until the transmission lines crosses Lake Havasu just north of the Parker Dam. Water features of this size are very uncommon in this part of the arid southwest and the scenic quality is rated as Class A as the line crosses the lake and travels up the very hilly terrain west of Parker Dam on the south side of the lake. The project area ends at the Parker Substation, located immediately to the west of the dam.

The Crossman Peak Natural Scenic Area (CPNSA) is located east of the ROW and forms a scenic backdrop to Lake Havasu City and the surrounding area. The ROW remains west of the CPNSA in a desert landscape with little visual diversity. This area is rated as scenic quality Class C.

Environmental Effects

Impacts of constructing the Southpoint Power Plant to visual resources are adequately addressed in the EIS (Hallock/Gross 1998).

Impacts of the gas pipeline and Topock project were found not significant by the BLM.

Visual impacts are evaluated by determining the degree of change or visual contrast caused by the proposed project. Long-term impacts would occur to the visual resource with the implementation of this project. New poles, although in an existing ROW, would add to the visibility of the ROW in some areas. The larger diameter conductor would also cause the wires to be slightly more noticeable, especially where the conductors are crossing roadways. Disturbed areas such as the wire pulling sites would take a substantial time to recover in this arid environment. Although these impacts may occur, the degree to which they change the existing visual quality is minor. All of the above described effects would be small and in most cases hardly noticeable, and are additive to the existing visual impacts. Overall, there would be no significant change in the scenic quality of the existing landscape.

Mitigation

Non-specular conductors will be used to minimize the visual impacts of the line. Generic and selective mitigation measures presented in Tables 3.1-4 and 3.1-5 would minimize potential impacts to visual quality, to the extent feasible. Specifically, Generic Mitigation Measures Nos. 1, 2, 3, 4, 15, 16, 17 and 18, and Selective Mitigation Measure Nos. 1, 2, and 3 would minimize visual impacts, minimize the area of disturbance, leave protective vegetation in place wherever possible, and restore disturbed areas as required by the landowner or land management agency. No further mitigation is recommended.

4.6 CULTURAL RESOURCES

Affected Environment

The culture history of the project area has been previously summarized (Dames and Moore 1997a, 1997b) and a history of the Mojave Indian Tribe is available (Hallock/Gross 1998). In general the area has been inhabited since the Archaic Period, or earlier times. A files search conducted for the Project Area revealed that, in addition to the survey for Topock Substation and transmission line (Bauer et al. 1997; Dames and Moore 1997a), four surveys had been performed in the general vicinity (Dosh and Dechambre 1991; Seymour 1991; Seymour et al. 1992; State Land Survey 1987 [no report]). The Topock Substation and transmission line survey documented 8 prehistoric sites and 121 isolated finds. Four of the sites are considered eligible for the National Register of Historic Places (NRHP) and four are considered not eligible. The types of sites recorded included lithic scatters with and without ceramics, a geoglyph ("dance circle"), an aboriginal trail, and petroglyphs. It was also noted that US Highway 66, a BLM designated Backcountry Byway and Arizona Department of Transportation listed historic road, is located about 1.25 miles from the Topock Substation.

The four other surveys in the general vicinity resulted in the documentation of 21 prehistoric and 2 historic sites. Fourteen of the prehistoric sites and both of the historic sites are considered eligible for the NRHP, two of the prehistoric sites are considered not eligible, and the remaining five are unevaluated. The types of prehistoric sites recorded by these surveys included scatters of artifacts with and without features, rock cairns, cleared areas, rock piles, sleeping circles, trail marker cairns, lithic quarries, trails, rock rings, roasting pits, rock walls, and rock alignments. The two historic sites consisted of a rock pile, a rock ring, and remnants of a telegraph line.

A cultural resources survey for the preferred alternative site for the proposed Southpoint Power Plant has been conducted (Wright 1995). This survey recorded three sites and four isolated finds within the preferred alternative site area. The three sites were recommended as eligible for the NHRP and three of the isolated finds were recommended not eligible. The remaining isolated find was unevaluated because of the possible presence of buried cultural materials at this location. Further investigation in January, 1999 by BIA, BLM and Tribal staff to locate this isolated find or any other related cultural material had negative results. The three sites consisted of a lithic scatter, a cobble feature (shrine or trial marker), and a grouping of small rock clusters.

Environmental Effects

There will be no impacts to cultural resources from constructing the Southpoint Power Plant (Hallock/Gross 1998).

Impacts of the Topock project were found not significant by the BLM. The gas pipeline will not affect any significant cultural resources.

Section 106 of the National Historic Preservation Act requires that the responsible agency take into consideration the effects a project may have on significant cultural resources. Significance is defined by the integrity of the resource and its ability to meet the criteria for listing on the NRHP as presented in 36 CFR 60.4. Impacts to significant cultural resources may occur as a result of several project-related activities. Direct impacts may result from access road improvement, construction of new H-frame structures, and ground disturbance at conductor pull sites. Potential impacts occurring as an indirect result of the proposed action include surface collecting of sites by project personnel and cumulative, long-term degradation as a result of improved public access into the project area. It is anticipated that the Proposed Action will result in a determination of no adverse effect on cultural resources in consideration of the proposed mitigation measures.

Mitigation

All aspects of the Southpoint Project have had cultural resource surveys completed except for the Parker-Davis No. 1 transmission line. This line will be surveyed prior to any construction activity. Mitigation identified for the Topock project cultural resources included data recovery, avoidance, and additional documentation of some of the sites.

Generic mitigation measures presented in Table 3.1-4 would minimize potential impacts to cultural resources. Specifically, Generic Mitigation Measures Numbers 6 and 7 provide standard steps to be taken to identify any unknown cultural resources and mitigate any effects to known or inadvertently discovered cultural resources. No further mitigation is required.

4.7 ENVIRONMENTAL JUSTICE

Executive Order 12898 requires Federal agencies to ensure that disproportionately high and adverse human health or environmental effects of its programs, policies, and activities do not effect minority and low-income populations.

Environmental justice was adequately addressed in the BIA EIS (Hallock/Gross 1998). The EAs prepared for the Topock project and the gas pipeline determined that both of these projects would benefit minority and low-income populations, primarily the Fort Mohave Indian Reservation. The upgrade would be on an existing facility and will not affect minority or low-income populations.

4.8 ELECTRICAL EFFECTS

Appendix B provides a general discussion of EMF as well as a discussion of EMF levels that are projected to emanate from the transmission line. Electric and magnetic field (EMF) field strengths would not change significantly with the proposed upgrade. None of the other associated facilities are would have a significant impact on the human environment through EMF.

Mitigation

Generic and selective mitigation measures presented in Table 3.1-4 would minimize potential impacts from electrical effects, to the extent feasible. Specifically, Generic Mitigation Measures Nos. 8, 9, 10, and 11, would minimize impacts to the public from electrical effects. No further mitigation is recommended.

4.9 IMPACTS SUMMARY

The following is a summary of significant impacts for the Project.

Table 4.9-1

IMPACTS SUMMARY

Impact Issue	Mitigation	Adequately Addressed?
• Effects on Desert Tortoise Habitat - Project construction and maintenance activities would disturb desert tortoise and their habitat.	• Desert tortoise mitigation plan includes surveys by a trained biologist just prior to initiation of project activities, removal to nearby suitable habitat if found, employee education, compensation for unmitigated impacts and other measures as described in Appendix A.	Yes - Effects to desert tortoise could still occur, but all reasonable protection measures would be taken.
• Disturbance of Bighorn Sheep Lambing Areas - Bighorn sheep are extremely sensitive to human disturbance.	• Construction and routine maintenance activities would not occur in designated lambing areas between January 1 and June 30.	Yes

Table 4.9-1

IMPACTS SUMMARY

Impact Issue	Mitigation	Adequately Addressed?
• Fire Protection/ Emergency Medical Response. There is no service to the proposed site.	• Modification of the existing contract between the FMIT and the Mojave Valley Fire Department to include the proposed power plant location.	Yes
• HazMat Response. Needed in the event of spills of anhydrous ammonia or chlorine. The nearest fully equipped and trained response team is 35 - 45 minutes away.	• The FMIT shall form a TERC which meets USEPA guidelines. • The FMIT shall enter into a contract with the Bullhead City Fire Department or other entity for response services.	Yes
• Traffic/transportation. Impacts during construction would be significant at the intersection of CR 227 and SR 95, and to and from the plant access road.	• Flaggers at appropriate locations. • Scheduling deliveries at off-peak times.	Yes
• Biota: Impacts to Migratory Birds From Evaporation Ponds. The ponds would be attractive to migratory birds. Proposed site is adjacent to the Havasu National Wildlife Refuge (HNWR), which has high migratory bird visitation. Selenium concentrations in the ponds pose a hazard and some birds may die.	• Location of ponds on bluffs, above the valley flyway. • Design of the pond, with steep side slopes. • Bird-of-prey decoys mounted on poles around the ponds, rotated weekly. • Flagging. • Quarterly monitoring of species visiting the ponds and hazardous substances in pond water and sediments, with review by the FMIT Environmental Protection Officer and Manager of the HNWR. • Netting to exclude waterfowl, if warranted.	Yes - Though minimized, potential impacts to migratory birds would remain for the life of the project. But would be addressed on a case by case basis.

Table 4.9-1

IMPACTS SUMMARY

Impact Issue	Mitigation	Adequately Addressed?
• Other Values and Conditions: Visual Resources. The proposed plant is a large scale industrial element which would be perceived as an adverse impact. • The proposed plant would be highly visible from the road between Needles and Golden Shores.	• Common quality of the landscape. • Numerous developments are planned in the Mojave Valley, with heights up to 10 stories. • Proposed location is extreme southwest corner of the Mojave Valley. • Plant would be painted with harmonizing colors. • Low traffic volume and low number of residents.	Yes - Though minimized, visual impacts would remain for the life of the project.
• Other Values and Conditions: Plant Illumination. Flashing stack lighting (over 200 feet high) and 15 acres of lighted plant area would be visible from most of the Mojave Valley, and the plant would be isolated from other major light sources.	Low number of viewers and distances.	No - Not needed
• Connected actions, e.g. increased development for agriculture, businesses, and housing are adequately addressed in the EIS		Yes
• Construction of a new transmission line corridor would concentrate new transmission lines in an area that previously had none.	• Installation of non-specular conductors. • Use of high-pressure sodium lights that are turned on only when maintenance personnel are present.	Yes – Though minimized, visual impacts would remain for the life of the project.
• Installation of the natural gas supply line would not be expected to result in significant impacts. Installation of the water line would allow development of economic benefit to the FMIT (e.g. additional agricultural lands, and housing developments)		Yes

4.10 CUMULATIVE EFFECTS

Cumulative effects include environmental consequences from past, present, and reasonably foreseeable future projects. Such effects may be minor individually, but may become significant when evaluated collectively.

Three new power plants have been proposed for construction in the vicinity of the Southpoint Power Project. These include the Blythe Energy Project, the Griffith Energy Project, and the Arizona Public Service Generation Plant. The Blythe Energy Project would be a 300-500 MW natural gas fired combined cycle facility to be located near the City of Blythe, California, about 60 miles south of Lake Havasu City. This project would interconnect with the regional grid at the existing Blythe Substation. The project size may vary from 300 to 500 MW depending on system access to electric power markets. The project would use advanced technology gas fired combustion turbines operating in combined cycle mode (Summit Energy Group 1998).

The Griffith Energy Project would be a 520 MW natural gas fired combined cycle facility to be located in Mohave County, Arizona near the City of Kingman about 30 miles northeast of Topock. The proposed generating facilities include two advanced gas fired turbines, each rated at 170 MW, and two heat recovery steam generators that deliver steam to a single steam turbine rated at 180 MW. Two new sections of transmission line would need to be constructed to serve the project. The first new line would connect this project with a Western owned 230-kV line located six miles directly north of the project site. The second new line would begin at the project site and travel approximately 30 miles parallel to the existing 230-kV transmission line past McConnico and Hilltop substations to the existing Western owned Mead to Liberty 345-kV transmission lines. A new substation would be built at the intersection of the two 230-kV lines and the two 345-kV lines (Summit Energy n.d.).

The Arizona Public Service (APS) has proposed constructing a 70 MW peaking generation facility to be located in Mohave County near the Griffith Energy Project, discussed above. The APS plant would be a natural gas-fired combustion turbine power plant which would generate power during peak load periods (e.g., summer). If the Griffith Energy Project is approved and built, the APS project would probably not be built (Hallock/Gross 1998; Bell 1999).

Other non-power plant projects have been proposed in the project vicinity. The Citizens Utilities Company (CUC) has proposed a new 230-kV transmission line between Kingman and Lake Havasu City. There is also the possibility that CUC will add substations at Yucca and Lake Havasu City when load requirements dictate such actions (BLM 1996).

A number of projects within the tri-state region that are reasonably foreseeable have been identified in the Southpoint Power Plant EIS (Hallock/Gross 1998). These include new casinos, new residential developments, and improvements in the regional transportation network, including proposed widening and upgrading of SR 95 between Interstate Highway 40 and Lake Havasu City.

Significant cumulative effects related to reasonably foreseeable future projects are not anticipated. Cumulative effects for each resource as a result of past, present, and reasonably foreseeable future projects within the area are summarized in the following sections.

Air Quality

Each of the proposed projects are gas fired. Gas is considered a “clean” fuel with low emissions. Each project must be reviewed by regulatory agencies charged with protection of the air quality including the prevention of significant deterioration. Each project will also be reviewed for the effect on Air Quality Related Values (AQRVs) including visual resources, and regional haze. At

this time, both the Arizona Public Service Generating Plant and the Blythe Energy Project are not sufficiently designed to include in the cumulative analysis. The combined impact of the Griffith Energy Project and the Southpoint Power Project has been reviewed and have met the screening criteria established by the federal land managers.

Water Quality

The cumulative impacts to water resources in the project area are expected to be low. Projects requiring construction in or near floodplains, springs, and surface water conveyances would adhere to agency and jurisdictional rules requiring mitigative measures and construction guidelines protecting the environment from any significant adverse impacts. Increases in sedimentation during construction or immediately following would only occur until vegetation is reestablished and is likely to be minor. With increasing population growth in the region, there will be a potential increase for water pollution and a greater demand for water resources.

Geology and Soils

The cumulative impacts to earth resources are expected to be low. It is assumed that projects built or to be built on state, Federal, tribal, or private lands would adhere to agency or jurisdictional rules and regulations requiring mitigative measures and construction guidelines protecting the environment from any adverse impacts. The construction of the proposed project would result in only minor incremental increases in soil erosion. These increases would typically be short term in duration and primarily limited to construction of the project, and for a short period of up to several years as vegetation is reestablished.

Biological Resources

A portion of the proposed project area, and the other projects analyzed for cumulative impacts are in regions where numerous subdivisions have recently been constructed or are planned for the near future. These actions will result in a cumulative loss of habitat for desert tortoise and other wildlife species. The increased human population associated with these subdivisions also increases the potential for harassment of wildlife, either intentional or accidental. If the proposed project results in increased access into areas which are relatively undisturbed, then it is likely that humans will use these roads for travel. This could result in a loss of vegetation due to trampling and off-road vehicular traffic, as well as disturbance to wildlife.

Floodplains

Implementation of appropriate mitigation measures are anticipated to minimize impacts related to disturbing any existing floodplains. Therefore, no significant cumulative impacts on floodplains are projected.

Visual Quality

Implementation of appropriate mitigation measures are anticipated to minimize impacts related to disturbing the existing viewing environments. Therefore, no significant cumulative impacts on visual resources are projected.

Cultural Resources

Protection is afforded to many cultural resources that would be affected by projects that must be authorized by federal or state licenses or permits, regardless of jurisdiction. Attempts to avoid or mitigate impacts on cultural resources are likely to be implemented as these projects are developed. Mitigation measures are likely to include recovery of important archaeological data, and any new knowledge of the past can be viewed as a beneficial effect. No significant adverse impacts are projected. In sum, the proposed Southpoint Power Project represents a relatively small increment to the loss of cultural resources within the local project area, and an even smaller increment within the larger region. The potential for satisfactorily mitigating impacts is high, and therefore no significant cumulative impacts on cultural resources are projected.

Following is a list of federal, state and local agencies and personnel consulted in preparation of this document.

Federal

Bureau of Indian Affairs
- Phoenix Area Office
- Colorado River Agency

BLM Kingman Resource Area

- Paul Hobbs - Soils Specialist
- Bill Wadsworth - Realty Specialist
- Bruce Asbjoin - Recreation Specialist

BLM Havasu Resource Area

- Elroy Masters, Wildlife Biologist
- Cory Bodman, Soils and Watershed
- Pat Boykin - Program Manager

Natural Resources Conservation Service - Kingsman Field Office

- Tom Stehly, Soils Specialist

U.S. Fish and Wildlife Service

- David Harlow, Field Supervisor

Tribal

Fort Mohave Indian Tribe

State

Arizona Game and Fish Department

- Aimee MacIlroy, Project Evaluation Specialist
- Bob Henery

Arizona State Lands

- Sheila McCaferty, Planning and Disposition

Arizona Department of Agriculture

- Chris Woodmansee, Plant Services Division

City and County

George Boone, Mojave County Public Works, FEMA Maps

Lake Havasu City, Community Development Department

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Appendix A

Desert Tortoise Mitigation Measures for BLM and State Property

1. A biological monitor would be assigned with every cluster of construction workers and every piece of earth moving equipment. This may mean more than one monitor per mile in certain instances.

In addition, in those areas designated by BLM as Category II or III desert tortoise habitat, the following mitigation measures shall be implemented:

2. There must be a biological monitor supervisor for the Project.
3. Between March 15 and Nov. 15, a walking clearance of working areas (around equipment, etc.) must be performed every morning and evening to check for tortoises. This clearance may be conducted by a biologist or any worker who has been through the "tortoise school."
4. Within 48 hours prior to onset of surface-disturbing activities, the construction ROW within desert tortoise habitat that is subject to immediate disturbance shall be inspected by a qualified biologist for tortoises and their burrows.
5. All tortoises found on the ground surface within construction areas shall be moved a minimum of 500 feet (preferably not more than one-quarter mile, but up to two miles from their original location) and placed in a shaded location. Tortoises that wander onto construction areas during construction periods shall also be removed to a safe location if necessary and shall be moved solely for the purpose of preventing death or injury.
6. Prior to any disturbance, burrows within the ROW that would be destroyed or disturbed by construction activities such as blasting, road building, etc. must be cleared of tortoises, then collapsed, destroyed or barricaded to prevent further entrance by tortoise. The tortoise within these burrows shall be moved to a safe location. The method of relocation should be determined by tortoise activity levels and ambient ground temperatures. The tortoise should be placed in a natural or artificially constructed burrow by a qualified biologist. Tortoise burrows within the construction ROW that are avoidable shall be protected by installation of welded wire fencing placed at a maximum distance from the burrow allowable by construction activities. If a minimum distance of 15 feet cannot be accommodated, the burrow shall be excavated. Tortoises removed from excavated burrows during inactive periods shall be relocated to unoccupied natural burrows or artificially constructed burrows.
7. A pre-construction desert tortoise survey by a biologist trained to conduct tortoise surveys is required in all tortoise habitat no earlier than 45 days (preferably no earlier than two weeks) prior to construction to identify burrows or other high-use tortoise areas. During these surveys, the status of previous survey results shall be reviewed and habitat features such as desert tortoise burrows shall be flagged and staked. All important habitat features within the construction ROW shall be flagged and staked to alert biological and work crews of their presence. Tortoise surveys would be required in all areas of new disturbance, which includes the ROW, new access roads (temporary or permanent), widened portions of existing access roads, equipment storage areas, etc. If additional disturbance is anticipated outside of the Project construction areas as it progresses, these should be surveyed as well.
8. Artificial burrows to which desert tortoises are relocated during tortoise inactivity periods shall be of similar size, shape, orientation and depth as original burrows.

9. If a burrow is too deep to see the end of it, a fiber optic scope or other device or technique of equal or better quality shall be used to determine if the burrow is occupied by a desert tortoise.

10. All desert tortoises handled by people shall be checked for symptoms of upper respiratory disease syndrome and the presence or absence of respiratory disease symptoms shall be noted on desert tortoise data sheets and the results included in a report to the authorized officer.

11. If a desert tortoise cannot be relocated within two miles from where it was found, then that tortoise must be salvaged in accordance with the Arizona Game & Fish Department's salvage techniques for desert tortoise.

12. All locations of desert tortoise or their sign would be mapped on a 7-1/2 minute topographical map with township, range and section noted, date, observer's name and vegetation type. Copies of this information would be given to the BLM authorized officer and to the Arizona Game & Fish Department in Phoenix.

13. Proponent is required to obtain all necessary permits for handling or collecting desert tortoise prior to construction.

14. To prevent mortality, injury and harassment of desert tortoise and damage to their burrows, no pets shall be permitted in any Project construction area.

15. Dust control watering of the ROW within desert tortoise habitat shall be conducted in a manner that would not result in development of ponds that could attract desert tortoises. If ponding is unavoidable, the ponded area and a five-meter-wide buffer area around the pond shall be flagged and staked or otherwise marked to prevent entry by vehicles. Alternatively, ponded areas shall be checked regularly by biological monitors, and desert tortoises found in pond vicinities shall be safely removed.

16. During any blasting activities, any desert tortoise burrow that is outside the ROW and is not excavated, but may be affected by blasting, shall be flagged and staked. Occupying desert tortoises shall be removed by a biologist, if they can be extracted without excavating the burrow. If desert tortoise cannot be removed from the burrows, crumpled newspaper shall be inserted to arms' length inside the burrow prior to blasting and removed immediately after cessation of blasting. Any tortoises that are removed from burrows shall be held in clean cardboard boxes, one tortoise per box, until they can be safely returned to the sites where they were collected.

17. All construction vehicles and equipment shall be restricted to the ROW and other areas to be disturbed to limit desert tortoise habitat degradation. If necessary, ROW boundaries and other areas to be disturbed outside of the ROW shall be flagged and staked to alert work crews. Areas to be flagged and staked would be identified in the plan of development.

18. The proponent shall develop and implement a worker education program that addresses (a) the occurrence and distribution of the desert tortoise within the construction area; (b) measures being implemented to protect the tortoise and its habitat in the construction area; and (c) specific protocols to observe should desert tortoises be encountered in the field.

19. In desert tortoise habitat, the proponent shall limit speed of vehicles along the ROW and access roads to 20 miles per hour. Construction and maintenance employees shall also be advised that care should be exercised when commuting to and from the Project area to reduce road mortality.

20. Surface-disturbing activities shall be minimized along the entire length of the ROW. Existing access roads shall be used for travel and equipment storage. Roads not needed after construction shall be blocked off and scarified. Access roads scheduled for upgrading in desert tortoise habitat should not be widened, if possible, nor should berms be disturbed during grading. New, permanent access roads shall not be created in desert tortoise habitat except where the ROW is not adjacent to an existing ROW or road. Stockpile areas in desert tortoise habitat should either be relocated to less valuable habitat or minimized in size.

21. The proponent shall make every reasonable effort to avoid damage to or destruction of desert tortoise burrows during construction activities. Such avoidance measures may include localized reduction in construction area width.

22. All trenches or other excavations with the potential to entrap desert tortoises shall be inspected by biological monitors for entrapped tortoises at the following times: (a) immediately prior to daily initiation of construction activities in portions of the ROW where active construction is occurring; (b) before ambient air temperatures exceed 95°F in portions of the ROW where active construction is not occurring; (c) at the end of each work day in all areas; and (d) prior to final back-filling of the trenches and other excavations. All tortoises found inside trenches during these inspections shall be removed immediately by a qualified biologist.

23. Compensation would be required for unmitigated residual impacts to desert tortoise habitat. An estimate of the amount of compensation would be determined in consultation with the authorized officer and recorded in the approved Plan of Development. Final compensation would be determined by the authorized officer once surface disturbing activities have ceased.

24. All disturbed areas not needed after construction would be restored by appropriate techniques, including recontouring, topsoil replacement, and revegetation, if required. Seed mixtures should include only native species, which have the greatest success potential and wildlife use.

Appendix B
Electrical Effects

The operation of a 230-kV AC transmission line causes electrical effects that result from corona and electromagnetic fields (electrical fields and magnetic fields). Corona is the discharge of ions from an energized line that occurs when the voltage gradient at the conductive surface exceeds the breakdown strength of air. Corona activity results in the generation of audible noise, photochemical oxidants, and radio and television interference. Corona activity for an AC transmission line is greater during rainy weather conditions.

AUDIBLE NOISE

Audible noise results from increased corona activity and is thus greatest during rainy weather conditions. The audible noise from a transmission line is generally a crackling sound with a definite 120 Hz component. The lateral attenuation of noise from a line source attenuates at a rate of 3 decibels per doubling of distance from the line. Because the air absorbs the higher frequency crackling noise more efficiently, this sound attenuates more rapidly than the lower frequency 120 Hz component resulting in an overall attenuation of somewhat greater than 3 decibels with each doubling of distance. In fair weather, the audible noise is expected to be 16 decibels at the edge of the right-of-way. In rainy weather, the audible noise is expected to be 41 decibels at the edge of the right-of-way.

PHOTOCHEMICAL OXIDANTS

Transmission lines generate minute amounts of photochemical oxidants as a result of corona discharge. Approximately 90 percent of the oxidants are ozone, while the remaining 10 percent are composed of nitrogen oxides. In carefully prepared tests, the ozone produced by transmission lines can be detected, but generally the nitrogen oxides have been below the detection limit. The concentrations of each, however, are insignificant and no effects are anticipated as a result of the transmission line.

RADIO AND TELEVISION INTERFERENCE

The radio-noise level of a 230-kV transmission line will be highest during heavy rain, lower in fair weather, and lowest just after a rain which has washed foreign particles off the conductors and the water has dried off of the conductors. Radio interference is more pronounced in areas of weak signal strength where the noise generated by the transmission line becomes more significant compared to the radio signal. Antennas located near transmission lines also cause radio interference to be more pronounced.

AM signals are more prone to interference than FM signals. Television pictures are more affected by transmission line noise than is television sound, since the television picture signals are AM and the television sound signals are FM. Television interference is most likely to affect channels 2-6, but is not likely to interfere with channels 7-83. AM radios are also more likely to be affected, since FM signals are highly resistant to transmission line interference.

Mitigation for interference is available upon customer request. Tightening line hardware to eliminate gap discharges, inspecting conductor surface for irregularities, relocating the customer's antenna, and installation of improved antennas are all used where problems occur. Experience with the many existing 230-kV AC transmission lines has shown that such problems can be solved on a case-by-case basis.

ELECTROMAGNETIC FIELDS

The electrical field calculated for this transmission line is 8.2 kV/m at the centerline of the towers. At the edge of the right-of-way, the electric field is calculated to be 1.7 kV/m. The maximum total induced body current in a person would be 0.13 mA in the 8.2 kV/m field and 0.03 mA in the 1.7 kV/m field, both of which are below the level of perception. The induced short circuit current in a camper truck parked directly in the 8.2 kV/m electric field would be about 2.3 mA which would be perceptible but only about half of the 5 milliamp standard set by the National Electric Safety Code. Thus, the short circuit current would be perceptible if a grounded person touched a camper truck parked at the maximum electric field point, but would still be far below the leg-to threshold of 9 mA for men, 8 mA for women, and 5 mA for children. This short-circuit current would only be about 0.5 mA for a camper truck parked at the edge of the right-of-way. Thus, ordinary vehicles parked within the right-of-way do not present a shock hazard.

With respect to long-term biological effects of electric fields, years of operating experience with 230-kV transmission lines have not revealed any identifiable biological hazard. Numerous studies of employee health and numerous studies of test animals and fundamental biological mechanisms in the laboratory do not indicate that these transmission lines pose a long-term biological hazard. These studies continue, and will continue into the future, but nothing to date indicates any reason to suspect that there is any long-term health effect that can be linked to the effects of electric fields from 500 kV transmission lines.

Magnetic Fields

The maximum magnetic field calculated for this transmission line when it is carrying 1,000 amps is 168 milligauss at the centerline of the towers. At the edge of the right-of-way, the magnetic field is calculated to be 36 milligauss. At 1,000 amps, the transmission line would nominally be carrying 1,500 megawatts, slightly more than its normal maximum working range. These numbers are similar to those obtained by measuring common household appliances; for instance, 168 milligauss at the centerline of the towers is slightly less than that of a household microwave oven, which was measured at 213 milligauss. Thirty-six milligauss lies between 31 milligauss observed at a computer terminal and 41 milligauss observed near an electric pencil sharpener. Overall levels 200 feet from the transmission line are in the same range as those found in typical public buildings.

Several studies performed in Colorado have suggested a correlation between the incidence of childhood cancer and proximity of homes to high current-carrying distribution and service lines. A similar study done in Rhode Island found no relationship between childhood leukemia and electric power line configurations. Several additional studies are underway to determine if any

such effect can be identified, and to identify possible biological mechanisms for any effects. This area of research is extremely active at the present time. Until more is known, projects are proceeding on the basis that exposures to magnetic fields from transmission lines are in the same range as exposures to other electrical equipment encountered in every day life. Long experience with such equipment has not demonstrated any pattern of health problems. The very difficulty now being experienced in identifying any linkage between magnetic fields and health problems shows that if an effect exists, it is not a strong one.

Based upon a review of the literature and discussions with investigators active in this research area, it can be concluded that magnetic field exposure due to a 230-kV transmission line is of the same order of magnitude as normal ambient levels found in everyday life and thus do not cause any significantly greater risk to biological organisms than the environment, without a 230-kV transmission line. This would suggest that if any hazards do exist, they are certainly small compared to other environmental factors. Finally, no one has proven any physical mechanisms by which magnetic fields could cause harm to biological organisms.